

3.2 Medical Requirements Overview**TABLE 3.2: MEDICAL REQUIREMENTS OVERVIEW**

MRID# and Title:	MR007L Toxicological Assessment Using the Dual Sorbent Tube
Sponsor:	Medical Operations
Discipline:	Environmental Health
Category:	Medical Requirements
References:	ISS Medical Operations Requirements Document SSP 50260
Purpose/Objectives:	To determine and assess crew exposure to volatile organic compounds in the air on ISS based on postflight analyses of in-flight samples using the Dual Sorbent Tube.
Measurement Parameters:	Identities and concentrations of airborne volatile organic compounds.
Deliverables:	Postflight report evaluating the concentrations of detected volatile organic compounds based on the collection and analyses of archival samples.
Flight Duration:	≥30 days
Number of Flights:	Progress 13P; resupply occurs every 3-6 months thereafter
Number and Type of Crewmembers Required:	Two crewmembers are trained in Environmental Health System (EHS) activities, of which one crewmember performs the inflight activity.
Other Flight Characteristics:	N/A

3.3 Preflight Training

TABLE 3.3: PREFLIGHT TRAINING

Preflight Training Activity	Description:	Two crewmembers will be trained in Environmental Health System (EHS) activities. Training will be covered under the following Environmental Health System (EHS) documents and lessons: EHS Toxicology Operations		
	Schedule:	Duration:	Schedule:	Flexibility:
		EHS Toxicology Operations: Experienced CM 30 min Inexperienced CM 60 min	L-12 months	N/A
Ground Support Requirements Hardware/Software	Preflight Hardware:	Preflight Software:	Test Location:	
	Dual Sorbent Tube	N/A	U.S.	
Training Facilities	Minimum Room Dimensions:	Number of Electrical Outlets:	Temperature Requirements:	Special Lighting:
	8' x 10'	None	Ambient	No
	Hot or Cold Running Water:	Privacy Requirements:	Other:	
	No	Private room free from any distractions	N/A	
Constraints/Special Requirements:	None			
Launch Delay Requirements:	Refresher training is conducted at crewmember request.			
Notes:	<ul style="list-style-type: none"> Experienced CM – had training within the last 1½ yrs. EHS Toxicology Operations includes training for GSC, CSA-CP, FMK, CDMK, and Dual Sorbent Tube if flown. 			

3.4 Preflight Activities – No Preflight Activities

3.5 In-Flight Activities

TABLE 3.5.1: IN-FLIGHT ACTIVITIES

In-Flight Activity	Description:	One Dual Sorbent Tube is used at each designated sampling location as defined in the in-flight schedule. During each sample, the kit is destowed and a tube, pump, and pump-tube adapter are removed from the kit. The inlet and outlet caps of the Dual Sorbent Tube are removed, and the tube is interfaced to the pump using the pump-tube adapter. The cabin air sample is forced through the Dual Sorbent Tube using the manual hand pump. After 5 strokes of the pump are taken, the end caps are reinstalled. The location, exact date and the time the activity occurred are manually recorded on the Dual Sorbent Tube attached label.			
	Schedule:	Activity:	Duration:	Schedule:	Personnel Required:
		Dual Sorbent Tube Archival Sampling	10 minutes unstow/stow 10 minutes/sample	Once every month in Lab & SM or FGB.	1 Operators
		Contingency Dual Sorbent Tube Archival Sampling	10 minutes unstow/stow 10 minutes/sample	As needed	1 Operator
Procedures:	Procedures are contained within the Systems Operation Data File (SODF) Med Ops book: Dual Sorbent Tube – Operations				
Constraints / Special Requirements:	<ul style="list-style-type: none"> • Samples should be collected near center of module near well-ventilated area. • Once/month Dual Sorbent Tube collections should be coordinated in time and location with Grab Sample Container (GSC) and Formaldehyde Monitor Kit (FMK) sample collections. • Sampling location should not be near air supply fans. • Contingency Dual Sorbent Tube samples may be collected when air quality is a concern or issue as requested by Crew Surgeon. • When possible during or following a contingency event, coordinate Dual Sorbent Tube collection with GSC and/or FMK sampling. The JSC Toxicology representative should be consulted for advice. 				
Photo / TV Requirements:	Photo documentation is required during contingency situations.				
Cold Stowage Requirements:	N/A				
Mission Extension Requirements:	N/A				
Landing Wave-Off Requirements:	N/A				
Data Delivery	Data/Report to Designated Recipients (Nominal/Contingency):				
	See Table 3.6 Postflight Activities				

TABLE 3.5.2: IN-FLIGHT HARDWARE

Hardware/ Software Name	P/N
Dual Sorbent Tubes Kit (Specific quantities per flight will be found in current manifest.)	SJG46120271-XXX

3.6 Postflight Activities

TABLE 3.6: POSTFLIGHT ACTIVITIES

Postflight Activity	Description:																
	-see below- <table border="1"> <thead> <tr> <th>Duration:</th> <th>Schedule:</th> <th>Flexibility:</th> <th>Personnel Required:</th> </tr> </thead> <tbody> <tr> <td>N/A</td> <td>N/A</td> <td>N/A</td> <td>N/A</td> </tr> <tr> <th>Hot or Cold Running Water:</th> <th>Privacy Requirements:</th> <th>Vibration/Acoustic Isolation:</th> <th>Other:</th> </tr> <tr> <td>N/A</td> <td>N/A</td> <td>N/A</td> <td>N/A</td> </tr> </tbody> </table>	Duration:	Schedule:	Flexibility:	Personnel Required:	N/A	N/A	N/A	N/A	Hot or Cold Running Water:	Privacy Requirements:	Vibration/Acoustic Isolation:	Other:	N/A	N/A	N/A	N/A
Duration:	Schedule:	Flexibility:	Personnel Required:														
N/A	N/A	N/A	N/A														
Hot or Cold Running Water:	Privacy Requirements:	Vibration/Acoustic Isolation:	Other:														
N/A	N/A	N/A	N/A														
Constraints/Special Requirements: Early Destow / Early Return Requirements:	<ul style="list-style-type: none"> Stowage temperatures during transport should not exceed 104°F. *The Dual Sorbent Tube samples collected during nominal operations are required to be destowed from the orbiter within R+3 hours to ensure the prompt return of the samples to the JSC Toxicology Laboratory within 48 hours. The Dual Sorbent Tube early-return contingency samples from an air quality incident are required to be destowed from the orbiter within R+3 hours to ensure the prompt return of the contingency samples to the JSC Toxicology Laboratory within 24 hours. 																
Notes:	<ul style="list-style-type: none"> EB is responsible for the early return of samples to JSC. 																
Data Delivery	<ul style="list-style-type: none"> A final report assessing the air quality on ISS will be provided to the Crew Surgeon, Mission Commander, Data Archivist, and MMOP participants no later than 3 months after return of the samples. Upon Crew Surgeon’s request a preliminary report will be provided postflight within 2 weeks following receipt of contingency samples. If all Dual Sorbent Tube samples are not completely analyzed within 2 weeks, sufficient data from GSCs and some Dual Sorbent Tubes should be available for a preliminary report. 																

3.7 Summary Schedule

TABLE 3.7: SUMMARY SCHEDULE

ACTIVITY	DURATION	SCHEDULE	PERSONNEL REQUIRED	CONSTRAINTS
Preflight Training				
EHS Toxicology Operation:	Experienced CM - 30 min Inexperienced CM - 60 min	L-12 months	Instructors/Crewmembers	None
Preflight Activity-N/A				
In-Flight				
Archival Dual Sorbent Tube Sampling	10 minutes unstow/stow 10 minutes/sample	Once every month in Lab & SM or FGB	1 Operator	-Samples should be collected near center of module near well-ventilated area. -Once/month Dual Sorbent Tube collections should be coordinated in time and location with GSC and FMK sample collections. -Sampling location should not be near air supply fans.
Contingency Dual Sorbent Tube Sampling	10 minutes unstow/stow 10 minutes/sample	As necessary	1 Operator	-Contingency Dual Sorbent Tube samples may be collected when air quality is a concern or issue as requested by Crew Surgeon. -When possible during or following a contingency event, Dual Sorbent Tube sample collection with GSC and/or FMK sampling. The JSC Toxicology rep. should be consulted for advice.
Wheels-Stop-N/A				
Postflight -N/A				
Postflight Debrief				
Debrief	No extra time	~R+30 days	Crewmembers/ Toxicology Team	Included as part of the MedOps overall debrief.